

AL.1.1276

CANADIANA

C2

AUG 29 1988



GRADE 12 DIPLOMA EXAMINATION

Biology 30

June 1988

Alberta
EDUCATION

**DUPLICATION OF THIS PAPER IN ANY MANNER OR ITS USE FOR
PURPOSES OTHER THAN THOSE AUTHORIZED AND SCHEDULED BY
ALBERTA EDUCATION IS STRICTLY PROHIBITED**

GRADE 12 DIPLOMA EXAMINATION BIOLOGY 30

DESCRIPTION

Time: 2½ hours

Total possible marks: 100

This is a **CLOSED-BOOK** examination consisting of two parts:

PART A: 80 multiple-choice questions each with a value of 1 mark.

PART B: Five written-response questions for a total of 20 marks.

GENERAL INSTRUCTIONS

Fill in the information on the answer sheet as directed by the examiner.

For multiple-choice questions, read each carefully and decide which of the choices BEST completes the statement or answers the question. Locate that question number on the answer sheet and fill in the space that corresponds to your choice. USE AN HB PENCIL ONLY.

Example

This examination is for the subject area of

Answer Sheet

A B C D

- A. Chemistry
- B. Biology
- C. Physics
- D. Mathematics

① ● ③ ④

If you wish to change an answer, please erase your first mark completely.

For written-response questions, read each carefully, and write your answer in the space provided in the examination booklet.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

DO NOT FOLD EITHER THE ANSWER SHEET OR THE EXAMINATION BOOKLET

The presiding examiner will collect the answer sheet and examination booklet for transmission to Alberta Education.

JUNE 1988

PART A

INSTRUCTIONS

There are 80 multiple-choice questions with a value of one mark each in this section of the examination. Use the separate answer sheet provided and follow the specific instructions given.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

WHEN YOU HAVE COMPLETED PART A, PROCEED DIRECTLY TO PART B

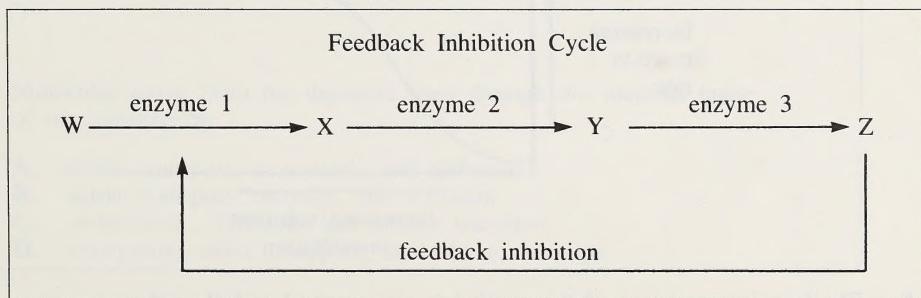
**DO NOT TURN THE PAGE TO START THE EXAMINATION UNTIL TOLD
TO DO SO BY THE PRESIDING EXAMINER**



Digitized by the Internet Archive in 2016

1. Ribosomes are organelles that
- A. produce cell proteins
 - B. make energy available to the cell
 - C. accept enzymes for packaging and redistribution
 - D. react with large molecules to bring them across the cell membrane
2. If the activity of the cell mitochondria is inhibited, which of the following occurs first?
- A. The concentration of ATP would decrease suddenly.
 - B. The osmotic pressure of the cell would increase.
 - C. The manufacture of cellular enzymes would cease.
 - D. The glucose concentrations in the cell would decrease suddenly.
3. Which cell organelle utilizes O₂?
- A. Ribosome
 - B. Lysosome
 - C. Mitochondrion
 - D. Endoplasmic reticulum
4. Cells absorb large molecules from a region of low concentration to one of high concentration by
- A. osmosis and diffusion
 - B. endocytosis and diffusion
 - C. active transport and exocytosis
 - D. endocytosis and active transport

Interpret the following flow chart to answer question 5.

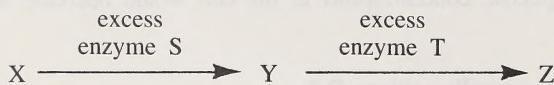


5. As Z accumulates in the cell, enzyme 1 will convert
- A. less Z to X
 - B. less W to X
 - C. more Z to X
 - D. more W to X

6. Hydrogen ion accumulation in living systems is prevented by the presence of
- A. water
 - B. enzymes
 - C. buffers
 - D. inhibitors

Interpret the following illustrated process to answer question 7.

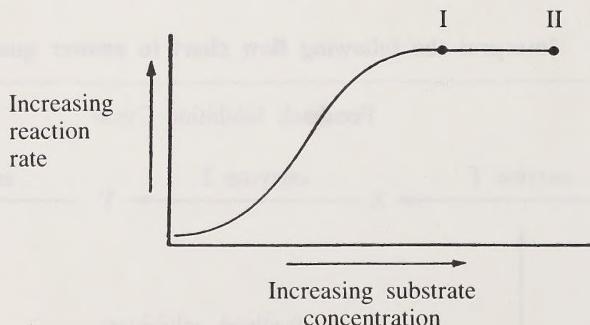
A Metabolic Pathway



7. An increase in the amount of substrate X will initially cause an increase in the binding of
- A. X with enzyme S and the reaction will continue
 - B. Z with enzyme T and the reaction will continue
 - C. Y with enzyme S and the reaction will continue
 - D. X with enzyme T and the reaction will continue

Use the following graph to answer question 8.

Reaction Rate vs. Substrate Concentration

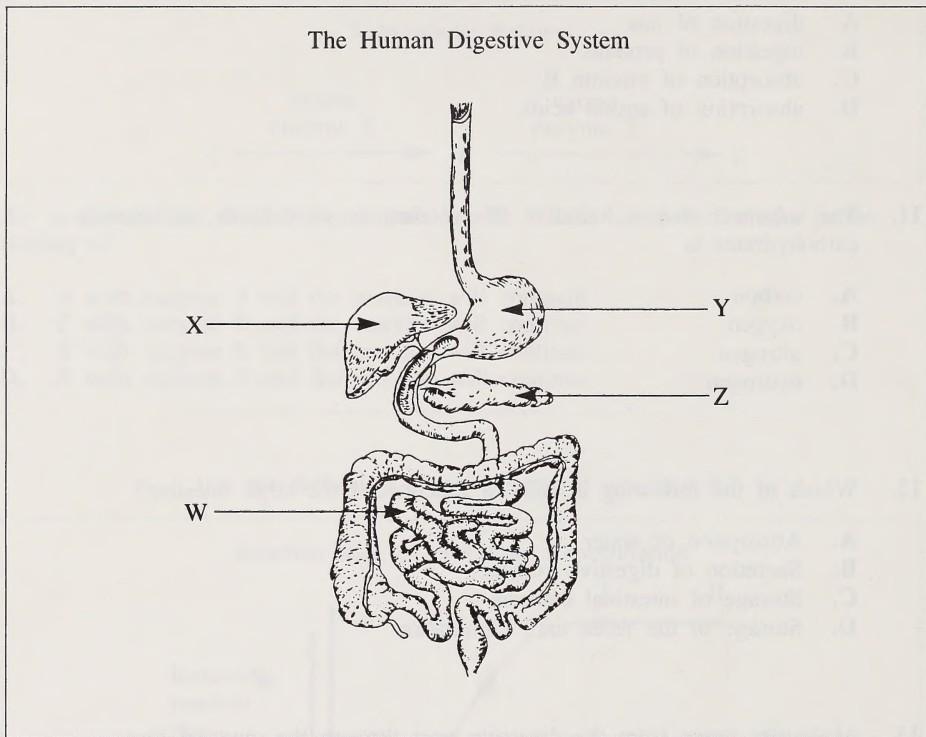


8. The best interpretation of the graph between points I and II is that
- A. the enzyme that is catalyzing the reaction has been denatured
 - B. increasing the substrate concentration will increase the reaction rate indefinitely
 - C. many of the active sites of the enzyme are still unoccupied by substrate molecules
 - D. something other than the substrate concentration is limiting the rate of the reaction

- 9.** An important function of villi is to
- A. decrease absorption rates into the capillaries
 - B. increase the surface area of the small intestine
 - C. increase peristaltic action of the small intestine
 - D. decrease absorption rates into the lymphatic system
- 10.** Gallstones often block the bile duct. This may result in inefficient
- A. digestion of fats
 - B. digestion of proteins
 - C. absorption of vitamin B
 - D. absorption of amino acids
- 11.** The substance that is found in all proteins, in some lipids, and not in carbohydrates is
- A. carbon
 - B. oxygen
 - C. nitrogen
 - D. hydrogen
- 12.** Which of the following is NOT a function of the large intestine?
- A. Absorption of water
 - B. Secretion of digestive enzymes
 - C. Storage of intestinal bacteria
 - D. Storage of the feces until elimination
- 13.** Molecules move from the digestive tract through the mucosal layer of the intestine by
- A. active transport, exocytosis, and diffusion
 - B. active transport, osmosis, and diffusion
 - C. endocytosis, diffusion, and tubular secretion
 - D. exocytosis, active transport, and tubular secretion
- 14.** Peristalsis results from the contraction of
- A. smooth muscle
 - B. cardiac muscle
 - C. skeletal muscle
 - D. longitudinal muscle

15. An end product formed as a result of the complete digestion of butter is
- A. glycogen
 - B. glycerol
 - C. lactose
 - D. lipase

Use the following diagram to answer question 16.



16. The section of the digestive system that inhibits bacterial activity because of its low pH is labelled
- A. W
 - B. X
 - C. Y
 - D. Z

- 17.** The hormone enterogastrone is released from the duodenum when fats are present in the small intestine. Enterogastrone affects the stomach by decreasing production of gastric juice as well as inhibiting peristalsis. Which of the following benefits would this control system have for digestion?
- A. Indigestion is prevented because food remains in the stomach longer.
 - B. Digested lipids can be absorbed into the blood because food remains in the stomach longer.
 - C. The liver can manufacture digestive enzymes for the duodenum because of a decrease in stomach activity.
 - D. There is sufficient time for the emulsification and digestion of lipids in the small intestine because of a decrease in stomach activity.

Use the following information to answer question 18.

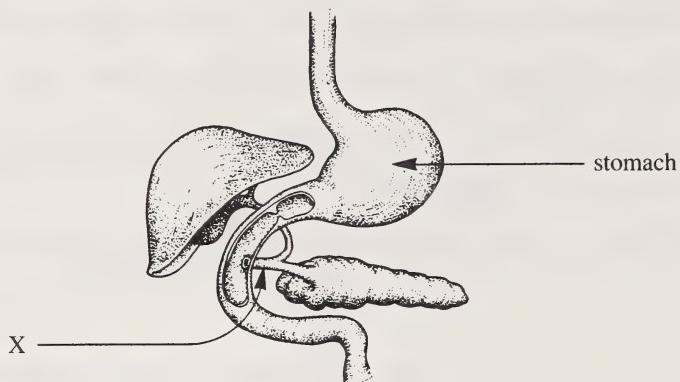
While investigating lipid digestion, a student made the following observations:

- 1. Suppressing bile secretion reduced fat absorption
- 2. Suppressing pancreatic secretion reduced fat absorption
- 3. Suppressing both bile and pancreatic secretion greatly reduced fat absorption

- 18.** What interpretation can be drawn from the observations?
- A. Fat absorption occurs only if the fat is emulsified.
 - B. Fat absorption is reduced if fats are not emulsified and digested.
 - C. Bile secretion reduces fat absorption more than does pancreatic secretion.
 - D. Pancreatic secretion contains a substance that significantly increases fat emulsification.
-

Use the following diagram to answer question 19.

Section of the Digestive System



19. If the duct labelled X were blocked, which combination of food types would not be adequately digested?
- A. Proteins, lipids, and carbohydrates
 - B. Lipids, carbohydrates, and vitamins
 - C. Carbohydrates, proteins, and fibre
 - D. Proteins, lipids, and minerals
-

Interpret the following table to answer question 20.

Solution Test \	I	II	III	IV
Iodine	blue-black	yellow-brown	blue-black	yellow-brown
Biuret	blue	pink/purple	pink/purple	pink/purple
Sudan IV	red	no color change	no color change	red
Translucence	yes	no	no	yes

20. Which solution contains BOTH starch and protein?

- A. I
 - B. II
 - C. III
 - D. IV
-

21. In the human leg, venous blood is kept moving MAINLY by

- A. the blood pressure of the capillaries
- B. high venule pressure, which pushes the blood back to the heart
- C. contraction of skeletal muscles, and a system of valves in the veins
- D. low pressure created in the ventricle, which pulls blood into the heart from all parts of the body

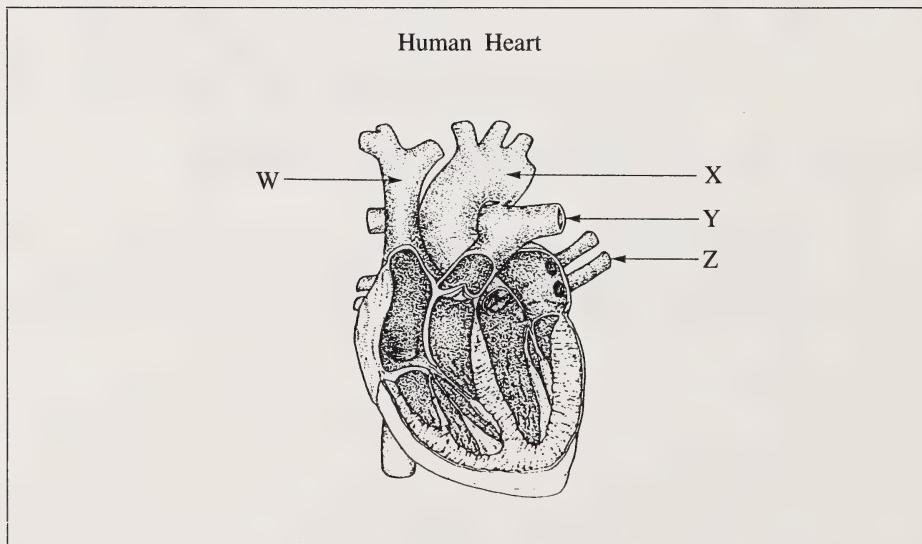
22. The following table contains the results of medical tests carried out on five patients.

Patient	% Saturation of Hemoglobin with O ₂ (arterial blood)	Cardiac Output (L/min)	Hemoglobin Content of Blood (g/L)	Heart Rate at Rest (beats/min)
I (normal)	90	5.0	160	72
II	88	5.5	186	71
III	52	5.5	148	80
IV	88	3.0	152	112
V	91	6.5	119	105

Interpret the data to identify the patient who is probably suffering from incomplete ventricular filling.

- A. II
 - B. III
 - C. IV
 - D. V
-

Use the following diagram to answer question 23.

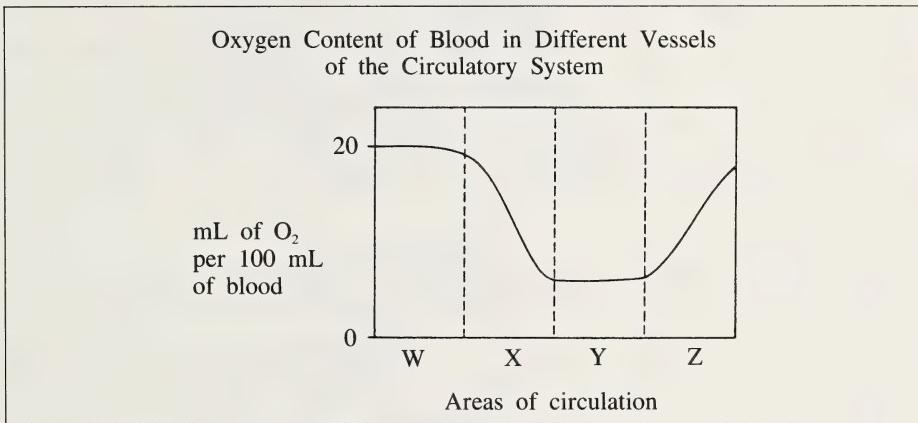


23. Deoxygenated blood from the body enters the heart through the structure labelled

- A. W
 - B. X
 - C. Y
 - D. Z
-

24. Blood is centrifuged to separate its cellular component from the plasma. The percentage of red blood cells in the cellular component is a measure of the blood's
- A. buffering capability
 - B. coagulation potential
 - C. oxygen-carrying capacity
 - D. antigen-resistance factor

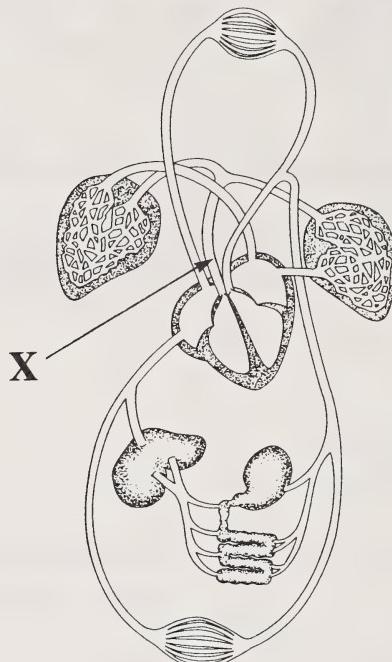
Interpret the following graph to answer question 25.



25. Region W of the graph could represent blood in
- A. a capillary
 - B. the vena cava
 - C. the pulmonary vein
 - D. the pulmonary artery
-
26. The time lapse between activation of the sinoatrial (SA) node and the activation of the atrioventricular (AV) node is necessary to allow the
- A. atria to contract before the ventricles
 - B. atria and ventricles to relax simultaneously
 - C. atria and ventricles to contract simultaneously
 - D. left and right ventricles to contract simultaneously
27. Even though more plasma leaks from the capillaries than is returned by reabsorption, blood plasma levels in the human circulatory system are kept constant because
- A. plasma return is assisted by active transport
 - B. the lymph vessels carry the plasma back to the blood
 - C. a regular intake of food and water replaces the lost plasma
 - D. the plasma returns to the capillaries between the heartbeats as osmotic pressure drops

Use the following diagram to answer question 28.

Human Circulatory System



28. The vessel labelled X is
- A. the aorta
 - B. a vena cava
 - C. a pulmonary vein
 - D. the pulmonary artery
-
29. Blood leaving the liver is characterized by
- A. decreased O₂ and decreased urea concentrations
 - B. increased O₂ and decreased urea concentrations
 - C. increased O₂ and increased urea concentrations
 - D. decreased O₂ and increased urea concentrations
30. A blood pressure reading of 180/100 mm Hg (24/14 kPa) could be attributed to
- A. dilation of venules
 - B. reduced blood volume
 - C. dilation of arterioles
 - D. narrowing of the arteries

31. Which is the most likely response to a decrease in blood pressure?
- A. Sympathetic stimulation increases, therefore the heart rate decreases.
 - B. Parasympathetic stimulation increases, therefore the heart rate increases.
 - C. Parasympathetic and sympathetic stimulation decrease, therefore the heart rate decreases.
 - D. Sympathetic stimulation increases and parasympathetic stimulation decreases, therefore the heart rate increases.
32. The aortic (semilunar) valve is open when
- A. aortic pressure exceeds left ventricular pressure
 - B. aortic pressure is less than left ventricular pressure
 - C. left atrial pressure exceeds left ventricular pressure
 - D. left atrial pressure is the same as left ventricular pressure
33. During ventricular contraction, a malfunctioning atrioventricular (AV) valve may result in an abnormal blood
- A. flow from ventricle to atrium
 - B. flow from atrium to ventricle
 - C. pressure increase in the arteries
 - D. pressure decrease in the venae cavae
34. A person with Rh-negative blood would develop Rh antibodies because of
- A. inherited Rh antigens
 - B. inherited Rh antibodies
 - C. contact with Rh antigens
 - D. contact with other Rh antibodies
35. The ability of blood to clot is reduced by
- A. rupturing of the platelets
 - B. low calcium ion concentration in the blood
 - C. high hemoglobin concentration in the blood
 - D. excess concentration of prothrombin in the blood
36. On a cold day, the temperature of the air reaching the alveoli is raised in the nasal passages because the
- A. surface area allows for transfer of heat
 - B. surface area allows for transfer of moisture
 - C. movement of air is increased due to the size of the passageways
 - D. rate of gas exchange is increased due to the large number of blood vessels

37. In humans, exhalation occurs when the diaphragm
- relaxes and moves downward, and the rib muscles contract, which moves the ribs up and out
 - contracts and moves downward, and the rib muscles contract, which moves the ribs up and out
 - contracts and moves upward, and the rib muscles relax, which moves the ribs down and in
 - relaxes and moves upward, and the rib muscles relax, which moves the ribs down and in
38. An initial DECREASE in breathing rate could be caused by
- moving from a high altitude to sea level
 - breathing into a paper bag for two minutes
 - reducing the concentration of hemoglobin in the blood
 - inhaling air that has a high concentration of carbon dioxide

Use the following information to answer question 39.

Hypoxia is a condition in which the availability or utilization of oxygen is restricted. The table below illustrates several cases of hypoxia as compared with the conditions of a normal individual. The individuals who participated in the tests were the same weight, sex, age, and height.

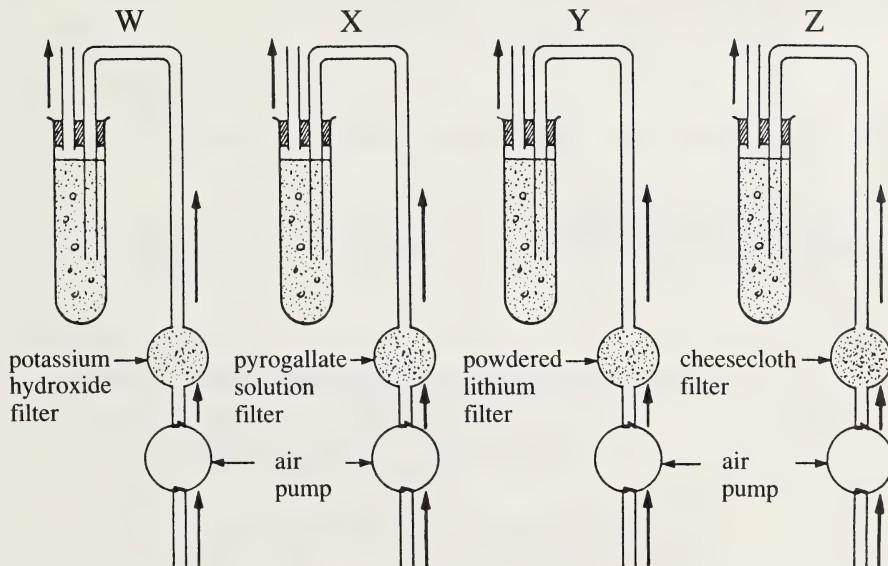
Individual	Cardiac Output (L/min)	Hemoglobin Content of Blood (g/100 mL of blood)	White Blood Cell Count (per mm ³)	O ₂ Content of Arterial Blood (mL/100 mL of blood)	O ₂ Content of Venous Blood (mL/100 mL of blood)
1. Normal	5.3	15	8 000	19.5	15.5
2. Hypoxia	7.0	15	8 000	15.5	12.5
3. Hypoxia	7.3	8	8 375	10.0	7.0
4. Hypoxia	3.3	16	7 900	20.3	13.3
5. Hypoxia	6.3	13	8 000	19.3	18.3
6. Hypoxia	7.3	15	10 000	18.0	13.0
7. Hypoxia	6.3	16	7 900	18.0	14.0

39. One individual is suffering from anemia and another from a bacterial infection. Respectively these two individuals MOST LIKELY are
- 2 and 3
 - 3 and 6
 - 3 and 7
 - 4 and 6

Use the following information to answer question 40.

Four test tubes, labelled W, X, Y, and Z, each containing an equal amount of live muscle tissue in a nutrient broth, were set up to test the effect of various gases on the rate of respiration. The temperature of the contents of each test tube was maintained at 37°C.

Note: - potassium hydroxide absorbs CO₂
- pyrogallate solution absorbs O₂
- powdered lithium absorbs N₂

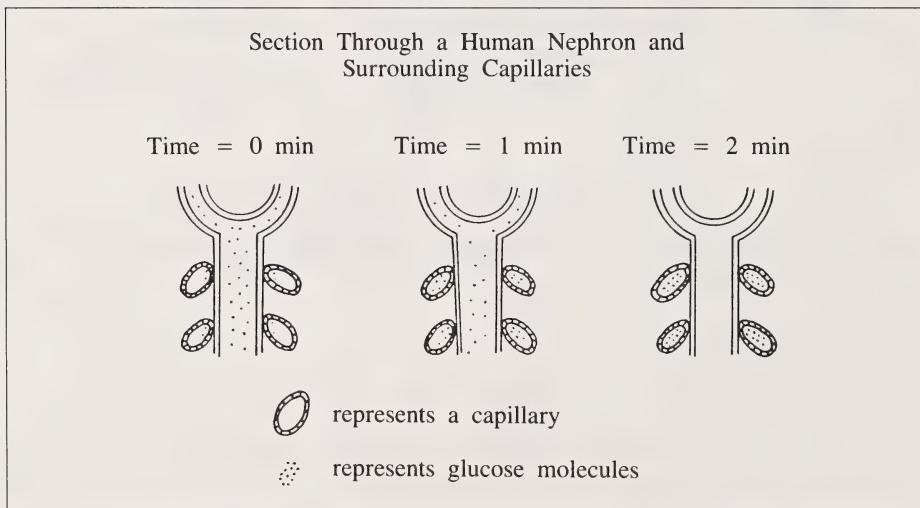


The heavy arrows indicate movement of gases.

40. The culture which acts as a control and the culture which respires anaerobically are respectively
- Y and W
 - Y and X
 - Z and W
 - Z and X
-
41. Blood leaving a kidney has lost much of its
- urea
 - plasma
 - glucose
 - vitamins

42. Filtration of blood plasma by the nephron occurs between the
- A. arteries and the loop of Henle
 - B. glomerulus and Bowman's capsule
 - C. capillaries and the distal tubule
 - D. capillaries and the proximal tubule
43. The normal sequence of processes in urine formation is
- A. filtration, reabsorption, tubular secretion
 - B. reabsorption, filtration, tubular secretion
 - C. tubular secretion, filtration, reabsorption
 - D. tubular secretion, reabsorption, filtration
44. The factor that exerts negative feedback control over the release of ADH is the amount of
- A. ADH in the blood
 - B. ADH in the urine
 - C. water in the blood
 - D. water in the urine

Use the following sequence of diagrams to answer question 45.



45. After two minutes, the concentration difference illustrated is due to
- A. osmosis
 - B. diffusion
 - C. endocytosis
 - D. active transport

46. A human blood sample contains a greater concentration of urea than normal. This may have been caused by the person having eaten excessive amounts of
- A. fat
 - B. sugar
 - C. starch
 - D. protein
47. Aldosterone acts on kidney tubules causing an increase in the reabsorption of
- A. urea
 - B. glucose
 - C. sodium ions
 - D. amino acids
48. Glomerulonephritis is an inflammatory condition that causes the walls of the glomeruli to become swollen and ruptured. The BEST indication of this condition would be the presence of
- A. glucose in the urine
 - B. urea and amino acids in the urine
 - C. red blood cells and plasma proteins in the urine
 - D. glucose, amino acids, and fatty acids in the urine

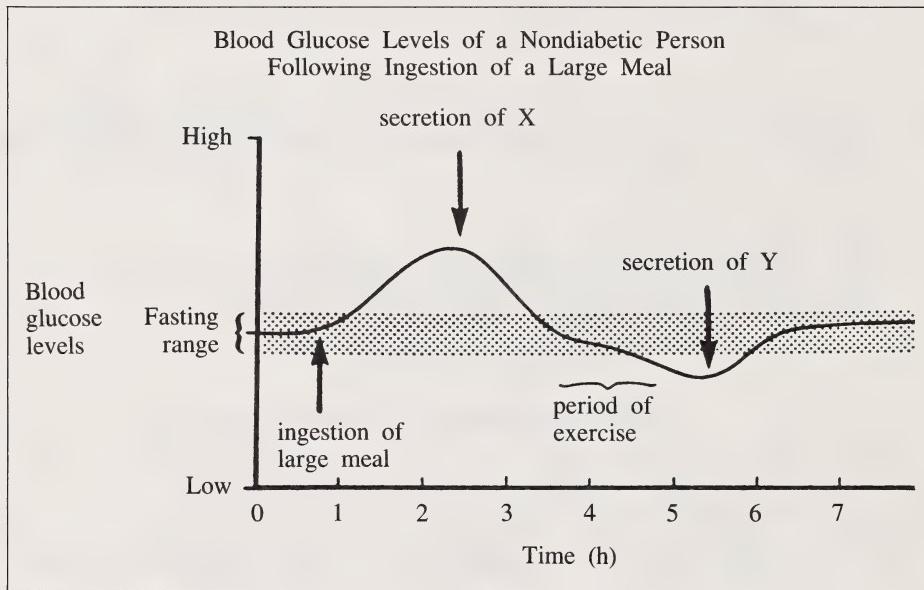
Use the following data to answer question 49.

Samples Taken from a Human Kidney			
Component	Composition of Samples (g/100 mL of fluid)		
	Sample 1	Sample 2	Sample 3
Urea	0.03	0.03	2.00
Glucose	0.10	0.10	0.00
Protein	0.007	7.000	0.000

49. Sample 2 was most likely taken from the
- A. glomerulus
 - B. loop of Henle
 - C. distal tubule
 - D. collecting tubule

50. The correct sequence depicting flow of materials through the nephron is
- proximal tubule → Bowman's capsule → distal tubule → loop of Henle → collecting tubule
 - Bowman's capsule → distal tubule → loop of Henle → proximal tubule → collecting tubule
 - proximal tubule → distal tubule → collecting tubule → Bowman's capsule → loop of Henle
 - Bowman's capsule → proximal tubule → loop of Henle → distal tubule → collecting tubule

Use the following graph to answer questions 51 and 52.

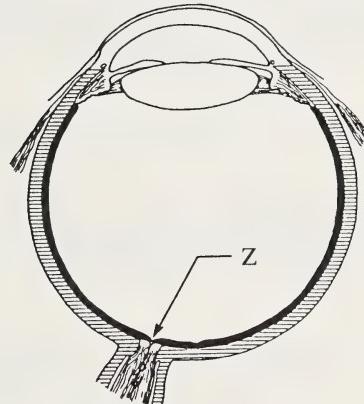


51. The secretion labelled X is
- insulin
 - gastrin
 - thyroxin
 - adrenalin
52. The secretion labelled Y helps to maintain homeostasis by converting
- proteins into glucose
 - glycogen into glucose
 - glucose into glycogen
 - proteins into glycogen

53. What would you expect to happen if iodine is removed from the diet for a long period of time?
- A. A decrease in the production of thyroxin
 - B. An increase in metabolism of stored fats
 - C. An increase in metabolic rate and body temperature
 - D. A decrease in the secretion of thyroid stimulating hormone

Use the following diagram to answer question 54.

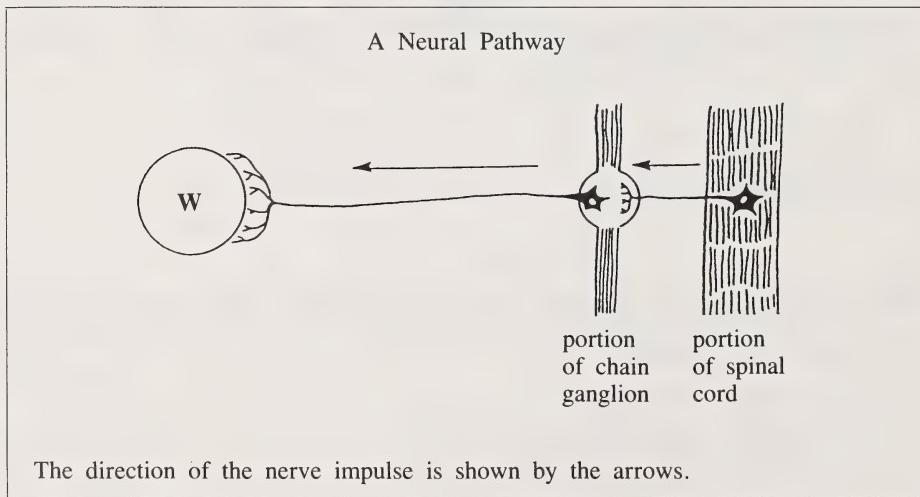
Cross Section of a Human Eye



54. Light energy falling only on the region labelled Z would result in
- A. no vision
 - B. blurred vision
 - C. acute color vision
 - D. black and white vision
-
55. People see little if they enter a dimly lit room after being outside on a sunny day. In a short while, shapes and objects become easier to see in the dim light. This time lapse is necessary for the
- A. lenses to accommodate
 - B. pupils to get smaller
 - C. rods to begin to function
 - D. cones to begin to function
56. Motion sickness is a result of stimulation of receptors in the
- A. cochlea
 - B. middle ear
 - C. organ of Corti
 - D. semicircular canals

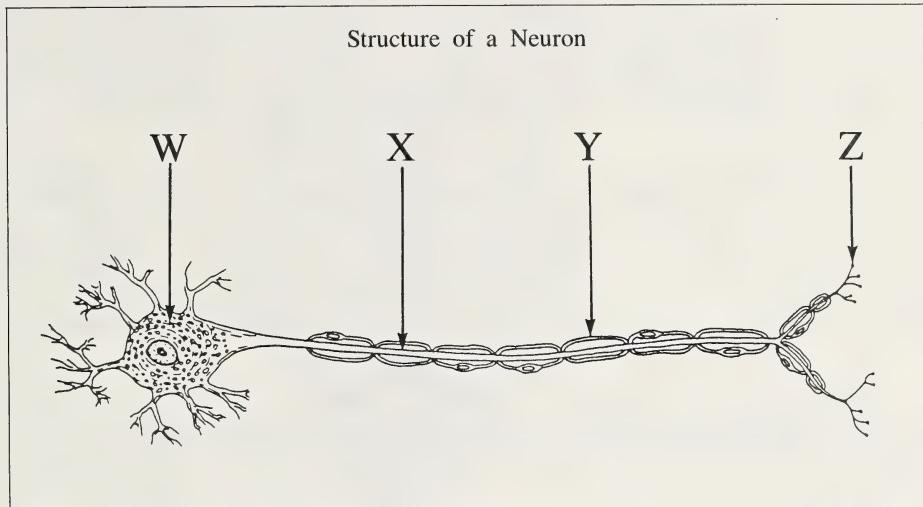
57. The structures that change vibrations to nerve impulses are located in the
- A. cochlea
 - B. ossicles
 - C. auditory nerve
 - D. eustachian tube
58. Response to a stimulus within the central nervous system differs from that of a reflex arc because
- A. depolarization does not occur along the reflex arc
 - B. no acetylcholine is released in the central nervous system
 - C. there is no interpretation of the information within the reflex arc
 - D. nerve impulses travel in the central nervous system at a greater speed
59. The presence of cholinesterase in the human nervous system allows
- A. one way impulse transmission
 - B. more rapid impulse conduction
 - C. a recovery period by destroying acetylcholine
 - D. acetylcholine to continue stimulating dendrites

Use the following diagram to answer question 60.



60. Structure W is most likely a
- A. gland or a sensory neuron
 - B. muscle or a receptor
 - C. gland or a receptor
 - D. muscle or a gland

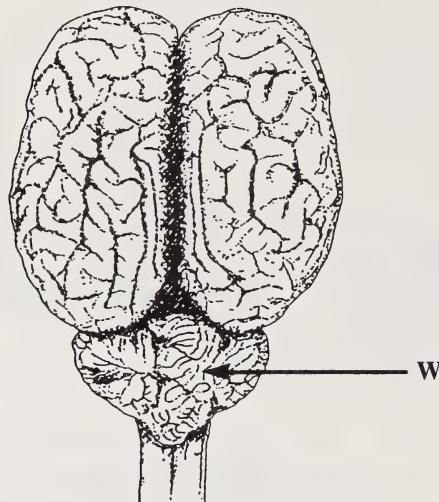
Use the following diagram to answer question 61.



61. The structure that secretes acetylcholine is labelled
- A. W
 - B. X
 - C. Y
 - D. Z
-
62. The body's return to homeostatic levels after vigorous exercise involves
- A. inhibition of both the parasympathetic and the sympathetic nervous systems
 - B. stimulation of both the parasympathetic and the sympathetic nervous systems
 - C. stimulation of the sympathetic nervous system and inhibition of the parasympathetic nervous system
 - D. stimulation of the parasympathetic nervous system and inhibition of the sympathetic nervous system
63. The threshold of a neuron refers to
- A. a polarity of 0.07 mV
 - B. the minimum stimulus required to achieve depolarization
 - C. the stimulus needed to achieve equal concentrations of sodium ions and potassium ions within the neuron
 - D. the stimulus needed to achieve sodium ion equilibrium between the cytoplasm and extracellular fluid (ECF)

Use the following diagram to answer question 64.

Dorsal View of a Human Brain

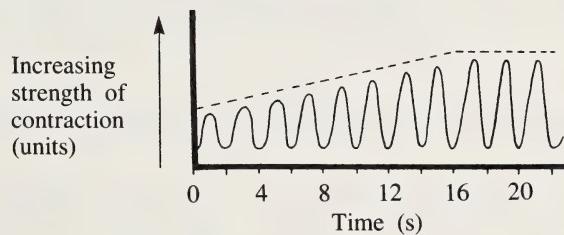


64. If region W were damaged, predict which should be most seriously affected.
- A. Spinal reflexes
 - B. Ability to read
 - C. Sense of balance
 - D. Ability to learn facts
-
65. If an injured person's heart and respiration rates varied unexpectedly, one might suspect damage to the
- A. cerebrum
 - B. cerebellum
 - C. spinal cord
 - D. medulla oblongata
66. A nerve impulse is BEST described as
- A. an enzyme-requiring chemical reaction inside the neuron
 - B. an electrochemical process occurring across the neuron's membrane
 - C. the diffusion of molecules along the neuron after they are released from the dendrite
 - D. the result of a change in osmotic pressure between inner and outer surfaces of the neuron's membrane

67. To raise and then lower the arm, the body uses a pair of
- A. smooth muscles, one of which contracts while the other relaxes
 - B. smooth muscles, both of which contract and relax simultaneously
 - C. skeletal muscles, one of which contracts while the other relaxes
 - D. skeletal muscles, both of which contract and relax simultaneously
68. A chemical that functions in the storage of energy in a muscle cell is
- A. actin
 - B. myosin
 - C. actomyosin
 - D. creatine phosphate
69. Botulism is a serious form of food poisoning. It results when a substance called botulinus toxin, produced by bacteria, prevents the release of acetylcholine from motor nerve fibres. The effect is
- A. the inability of ATP to be released
 - B. the failure of muscles to be stimulated
 - C. a decrease in pH due to buildup of lactic acid
 - D. contraction of all skeletal muscles, resulting in paralysis

Use the following graph to answer question 70.

The Effects on the Strength of Muscle Contraction
by an Electric Impulse of Increasing Intensity

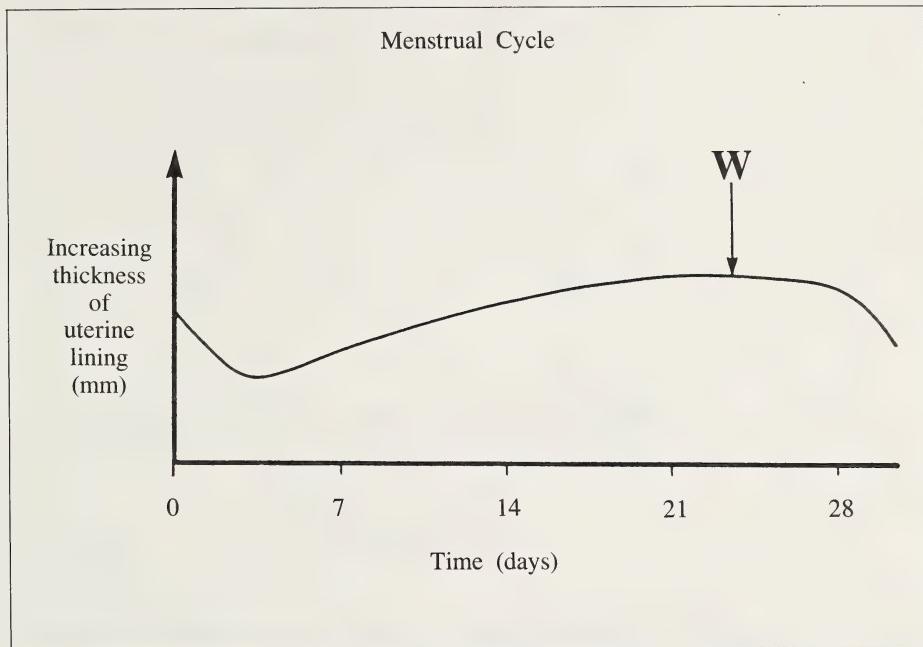


Note: A stimulus is applied every two seconds. Each stimulus is administered at an increased voltage level.

70. The strength of contraction reaches a plateau beyond which increased voltage has no greater effect because all
- A. myofibrils are contracted
 - B. myofibrils are fatigued
 - C. the acetylcholine has been used
 - D. the creatine phosphate has been used

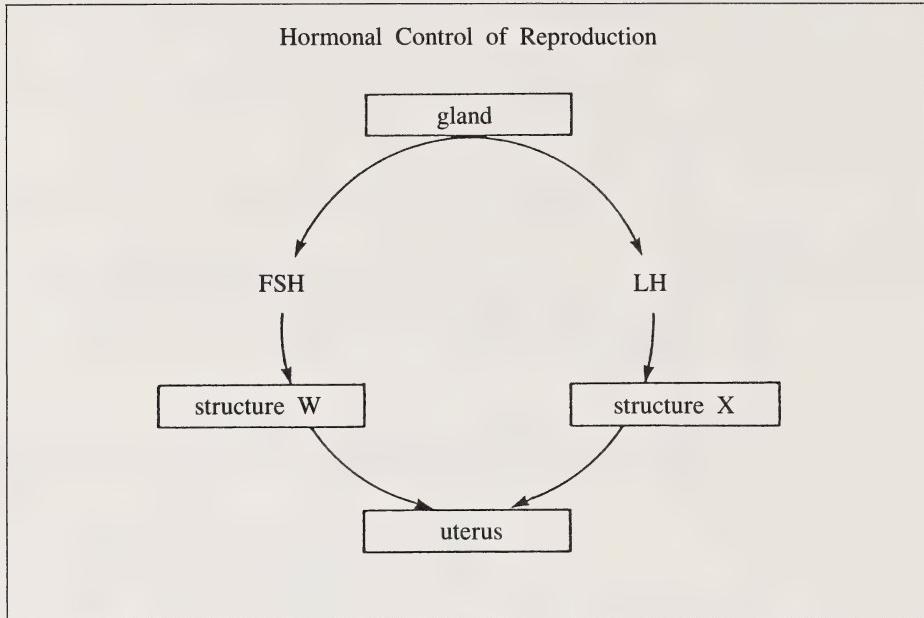
71. What happens if the vasa deferentia (plural of vas deferens) in a male are severed?
- A. Sperm production ceases.
 - B. Sperm do not reach the urethra.
 - C. Testosterone production decreases.
 - D. Male secondary sexual characteristics do not develop.
72. Which of the following is NOT a function of sperm?
- A. Providing nutrients for the sperm cells
 - B. Supplying nourishment for the fertilized egg
 - C. Providing a transport medium for the sperm cells
 - D. Protecting the sperm cells against an acidic environment
73. Testosterone is sometimes used in treating cancer of the vagina. A side effect of this treatment would be that the patient may
- A. produce and secrete male sex hormones
 - B. develop male primary sex characteristics
 - C. develop male secondary sex characteristics
 - D. acquire both male primary and male secondary sex characteristics
74. The function of the placenta is to
- A. manufacture food for the embryo
 - B. provide hormones utilized by the fetus
 - C. transport metabolic wastes from mother to embryo
 - D. exchange gases and nutrients between the mother and the fetus
75. The sequence of structures through which the sperm move to achieve fertilization is
- A. uterus → Fallopian tube → ovary
 - B. cervix → Fallopian tube → ovary
 - C. uterus → Fallopian tube → cervix
 - D. cervix → uterus → Fallopian tube
76. Only one corpus luteum formed in the ovaries of a woman who subsequently gave birth to quadruplets. This would indicate that
- A. the babies must be identical
 - B. there is a lack of progesterone
 - C. there are likely two sets of twins
 - D. the other follicular cells did not form corpora lutea

Use the following graph to answer question 77.



77. Which hormone would be found at its highest concentration at the point indicated by the arrow labelled W on the graph?
- A. LH
 - B. FSH
 - C. Estrogen
 - D. Progesterone
78. During ovulation, production of the hormones
- A. FSH and estrogen stops
 - B. estrogen and LH is both high
 - C. progesterone and FSH is both high
 - D. estrogen and progesterone is both low
79. A malfunction of the placenta may cause premature birth because of
- A. increased relaxin secretions
 - B. decreased relaxin secretions
 - C. increased progesterone secretions
 - D. decreased progesterone secretions

Use the following diagram to answer question 80.



80. In the diagram, W and X represent respectively

- A. placenta and ovary
- B. pituitary and ovary
- C. follicle and corpus luteum
- D. placenta and corpus luteum

YOU HAVE NOW COMPLETED THE MULTIPLE-CHOICE SECTION OF THE EXAMINATION. PLEASE PROCEED TO THE NEXT PAGE AND ANSWER THE WRITTEN-RESPONSE QUESTIONS IN PART B.

PART B

INSTRUCTIONS

Please write your answers in the examination booklet as neatly as possible.

Communicate your answers in clear, concise sentences. Marks will be awarded for pertinent explanations and answers.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

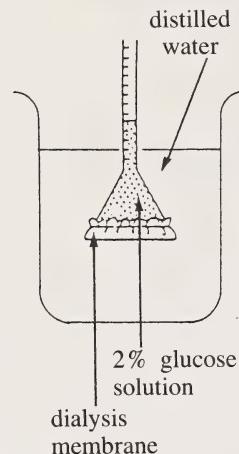
TOTAL MARKS: 20

START PART B IMMEDIATELY

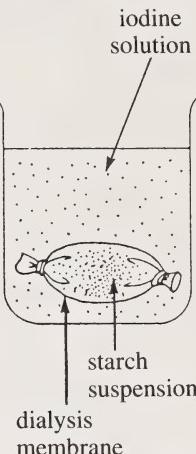
Use the following information to answer question 1.

Three experiments were set up initially as shown below.

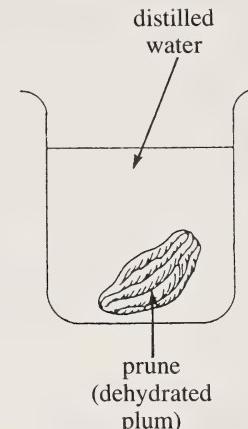
Experiment 1



Experiment 2



Experiment 3



(5 marks)

- Using complete sentences which link the major ideas, discuss what can be expected to occur in each of the three experiments after one hour had elapsed, giving reasons for your choice of predictions. In your discussion, identify which apparatus could be used to quantitatively measure the rate of molecular movement.

Question 1 (continued)

2. Describe in complete sentence form TWO important nutritional functions of the liver and explain how each is important in maintaining homeostasis in the body.

(4 marks)

(4 marks)

3. Some people are unable to detect even the strongest odors. Use complete sentences to provide FOUR likely physiological explanations why such persons lack a sense of smell.

Use the following information to answer question 4.

Recent research has shown that cigarette smoke may result in the following:

Effect I : Destruction of many of the cilia that line parts of the respiratory system.

Effect II : Rupturing of the walls of some of the alveoli.

Effect III: Thickening of the walls of the bronchioles, thus narrowing their diameter.

4. For each of the three effects, describe in complete sentences how the smoking of cigarettes interferes with the normal functioning of the respiratory tract.

(3 marks)

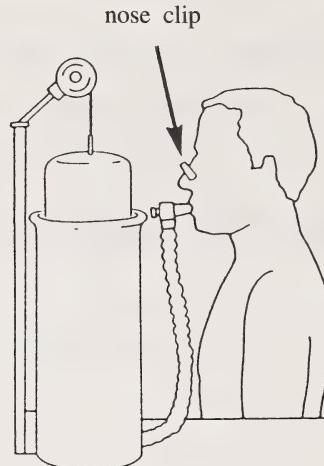
Effect I _____

Effect II _____

Effect III _____

Use the following information to answer question 5.

Represented below is a device which may be used to determine metabolic rate by measuring oxygen consumption.



(4 marks)

5. A student designed an experiment using the device represented above to investigate the relationship between age and metabolic rate of 100 human subjects. Using complete sentences, discuss TWO variables of the subjects that should be controlled in order to obtain reliable data. In your discussion, include justification for the variables identified.

Question 5 (continued)

**YOU HAVE NOW COMPLETED THE EXAMINATION. IF YOU HAVE TIME,
YOU MAY WISH TO GO BACK AND CHECK YOUR ANSWERS.**

(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION

(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION

(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION

(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION

FOR DEPARTMENT USE ONLY

- M1
- M2
- M3
- M4

FOR DEPARTMENT USE ONLY

BIOLOGY 30

(LAST NAME) _____

(FIRST NAME) _____

Y
M
D
SEX:

SEX:

PERMANENT MAILING ADDRESS:

(Apt./Street/Ave./P.O. Box)

(Village/Town/City)

(Postal Code)

SCHOOL CODE: SCHOOL: _____

SIGNATURE:

FOR DEPARTMENT USE ONLY

BIOLOGY 30